UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
805 SW Broadway, Suite 500
Portland, Oregon 97205

July 24, 2008

Mr. Robert Wyatt
Northwest Natural & Co-Chairman, Lower Willamette Group
220 Northwest Second Avenue
Portland, Oregon 97209

Re: Portland Harbor Superfund Site; Administrative Order on Consent for Remedial Investigation and Feasibility Study; Docket No. CERCLA-10-2001-0240 – Background Data Processing and Outlier Identification

Dear Mr. Wyatt:

EPA has reviewed the Background Data Processing and Outlier Identification Memo (Background Memo) developed by the Lower Willamette Group (LWG) dated July 3, 2008. The stated purpose of the Background Memo is to describe an outlier review and evaluation approach that can be applied consistently to the background bedded sediment dataset. EPA and the LWG had previously agreed on the various uses of background (six different uses were agreed to: PRG development, risk characterization, development of remediation goals and AOPCs (hill topping replacement values), criteria for assessing long-term monitoring, evaluation of potential capping material, and possibly recontamination evaluation). The approach outlined in the Background Memo is proposed for developing background estimates for bedded sediments in the draft Remedial Investigation (RI) Report.

The Background Memo evaluates "several chemicals expected to pose risk in the harbor" and describes the approach for determining whether statistical outliers in the background data set should be included in the background data set. In general, the procedures described in the Background Memo followed the approaches outlined in ProUCL 4.0. Statistical outliers were further evaluated through application of best professional judgment to determine whether statistical outliers should be eliminated or considered be representative of the background population. The Background Memo indentified two outlier types – primary outliers and potential outliers. Primary outliers are those statistical outliers where the ratio of outlier to mean is "approaching an order of magnitude." Potential outliers were identified based on statistical tests. The Background Memo proposed to eliminate primary outliers but retain potential outliers. EPA Comments on the Background Memo are presented below:

1. Although EPA agrees with the elimination of primary outliers, the identification of primary outliers appears somewhat subjective. For example no justification is provided for the “approaching an order of magnitude criterion.

2. Potential outliers should be evaluated on a geographic basis. Potential outliers that are clustered together are indicative of local sources of contamination and thus are not reflective of background conditions. Clustered outliers should be eliminated from the background data set. Potential outliers that are distributed geographically may be retained. This approach results in the elimination of the 4 potential total PCB outliers (all collected between RM 16 and 17) and two potential total DDT outliers (all collected at RM 23). In contrast, the evaluation of PCB TEQ identified four potential outliers identified at RM 16, 17, 26 and 27. Because these outliers are distributed through the upriver area, they may be retained for inclusion in the background data set.

3. As an alternative to the outlier approach, estimating the mean background concentration and other background statistics through a bootstrapping technique should also be considered. The approach presented in the background memo identifies outliers based on a comparison to normal distributions. This approach may not be appropriate for distributions that are log-normal (as the background data set likely is) and is true even when using the non-parametric Kaplan-Meier method. The bootstrapping technique also avoids the possibility of introducing bias through the elimination of data from the background data set.

4. The statistical methods employed in the background evaluation should be supplemented by spatial analysis. Spatial techniques could be fairly simple (tessellation or inverse-distance weighting) or more complex (krieging). Some exploration of the data would be useful in determining what methods would be most efficient. A combination of parallel probability plots (p-plots) and spatial analysis applied at the AOPC level would likely provide the support needed to make decisions on clean-up. For example, parallel p-plots would help establish a lower limit to PRGs based on background and spatial analysis would help determine if "hilltopping" might be possible.

5. The background evaluation should be performed for chemicals for which preliminary remediation goals (PRGs) will be developed. This may result in a different suite of chemicals than will be evaluated in the baseline human health and ecological risk assessments. For example, for PCBs and dioxins and furans, the risk assessment will evaluate total PCBs, dioxin/furan toxicity equivalent quotient (TEQ) and dioxin-like PCB TEQ. However, if PRGs are developed on a congener specific basis (e.g., PCB congeners 118, 126 and 169), background estimates should be developed for PCB congeners 118, 126 and 169 in order to allow a direct PRG comparison.

EPA understands that the development of sediment PRGs and background concentrations will proceed concurrently with the drafting of the baseline ecological and human health risk assessments and will be presented to EPA in a supplemental document this coming fall. Please incorporate these comments into the development of background concentrations and presentation

of background data in the draft RI Report. EPA will be providing direction on the development of PRGs, consistent with our discussions, in the very near future.

If you have any questions, please contact Chip Humphrey at (503) 326-2678 or Eric Blischke (503) 326-4006. All legal inquiries should be directed to Lori Cora at (206) 553-1115.

Sincerely,

Chip Humphrey
Eric Blischke
Remedial Project Managers

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